FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
THE BEECHES, SPALDING

FINAL REPORT

ECL0965/G R MERCHANT LTD

DATE FEBRUARY 2023

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1.0 INTRODUCTION

This Flood Risk Assessment has been prepared in accordance with National Planning Policy Framework (NPPF) and supporting planning practice guidance (PPG) on Flood Risk and Coastal Change.

In areas at risk of flooding or for sites of 1 hectare or more, developers are required to undertake a site-specific Flood Risk Assessment to accompany an application for planning permission. This Flood Risk Assessment has been produced on behalf of G R Merchant Ltd in respect of a proposed development that consists of one dwelling at 1 The Beeches, Spalding.

A planning application for the proposed development is to be submitted by G R Merchant Ltd.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at 1 The Beeches, Spalding, Lincolnshire, PE11 1UE. The National Grid Reference of the site is 52522/32275.

The location of the site is shown in Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is within the curtilage of 1 The Beeches. The Beeches is a cul-de-sac on the northern side of Beechfield Gardens. The site is to the south west of the dwelling at 1 The Beeches and serves as residential garden space to the dwelling. The area of the proposed development is approximately 0.22 hectares.

Environment Agency LiDAR data shows that the site is flat with typical ground levels between +3.5m OD and +3.6m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water at the site drains through a local network and hence to the IDB drain system. Exeter Drain, an IDB High Priority Watercourse, is approximately 300m east of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by Oxford Clay Formation mudstone. The bedrock is shown to be overlain with superficial deposits of clay and silt.

2.3 Proposed Development

The proposed development consists of one dwelling. The dwelling will have two storeys. Details of the proposed development are provided in Attachment 1.

2.4 Local Development Documents

The South East Lincolnshire Local Plan 2011 – 2036, adopted in March 2019, is the Local Plan for the district. Policy 4: Approach to Flood Risk states the requirements for flood risk reduction.

The South East Lincolnshire Level 1 and Level 2 Strategic Flood Risk Assessment (SFRA) was prepared in June 2017.

The Joint Lincolnshire Flood Risk and Drainage Management Strategy has been prepared by Lincolnshire County Council as the Lead Local Flood Authority. The purpose of the Strategy is to increase the safety of people across Lincolnshire by reducing the number of people at risk of flooding, increasing the resilience of local communities, and reducing the impact of flooding

2.5 Flood Zones

An extract from the Environment Agency Flood Map for Planning is shown in Figure 2. The site is located within Flood Zone 3, an area with a high probability of flooding.

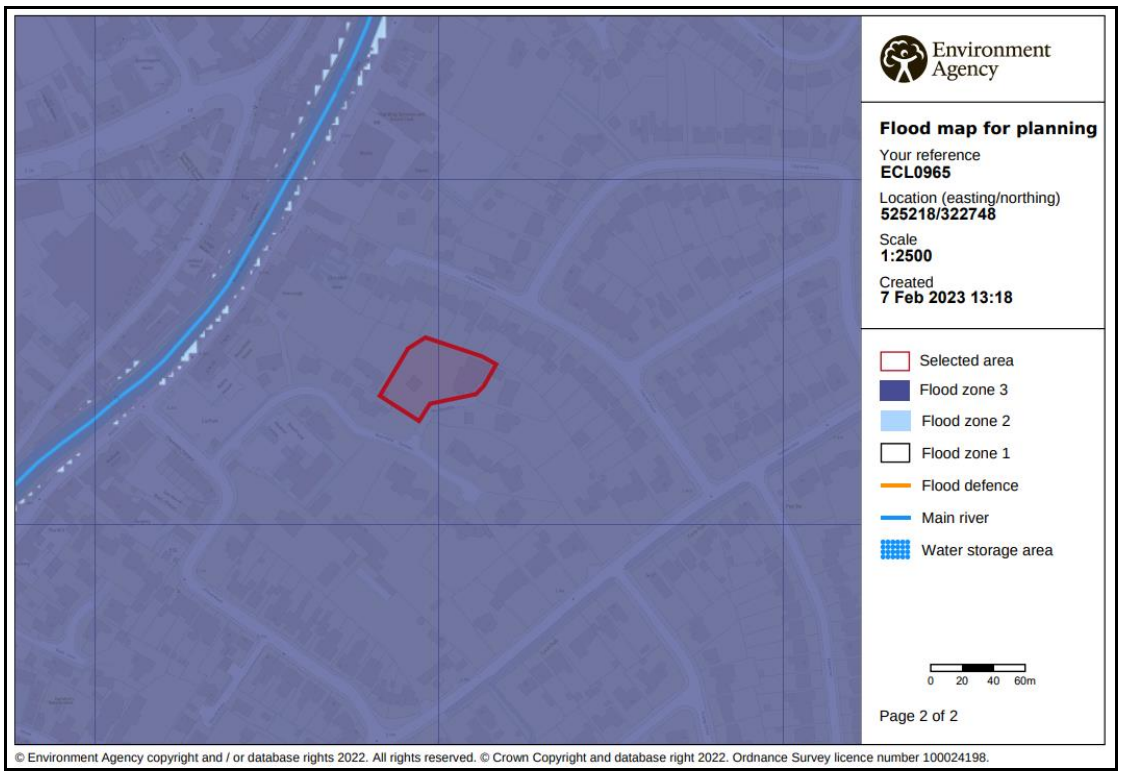


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a medium risk of flooding from rivers or the sea (annual probability between 1% and 3.3%);
- part of the site has a low risk of surface water flooding (annual probability between 1% and 0.1%); and
- the site is not within an area at risk of reservoir flooding.

Table 1 shows the level of risk at the site within the South East Lincolnshire SFRA.

SFRA Map	Present Day	2116
Residual Flood Hazard Map for the 1% fluvial and 0.5% tidal event	The site is in the 'Danger for Most' area	The site is in the 'Danger for All' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal event	The site is at risk with peak depths between 1m and 2m	The site is at risk with peak depths greater than 2m

Table 1 – Flood Risk within SFRA Maps

3.0 FLOOD RISK VULNERABILITY

3.1 The Sequential and Exception Test

The NPPF requires the application of a Sequential Test to ensure that new development is in areas with the lowest probability of flooding.

The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.

3.2 Vulnerability Classification

Table 2 of the PPG Flood Risk and Coastal Change categorises different types of uses and development according to their vulnerability to flood risk. The proposed development is covered by the description of buildings used for dwellings and is classified as 'More Vulnerable'.

Table 3 of the PPG Flood Risk and Coastal Change sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is in Flood Zone 3 and the development is 'More Vulnerable' therefore it is necessary to complete the Exception Test.

PPG Flood Risk and Coastal Change defines that the lifetime of the development in terms of flood risk and coastal change is 100 years.

3.3 Application of the Sequential Test and Exception Test

It is for the Local Planning Authority, using the evidence provided and taking advice from the Environment Agency as appropriate, to consider whether an application passes the Sequential Test.

Large parts of the South Holland district close to the River Welland lie within Flood Zone 3. As such, opportunities to undertake the development at an alternative site with a lower flood risk are limited. The Environment Agency Flood Maps for Planning show that the whole of Spalding is within Flood Zone 3. In this context it is noted that SE Lincolnshire Local Plan residential allocations are within flood risk areas due to the lack of availability of sites within areas of lower flood risk.

The River Welland has defences that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event including climate change. The site therefore has a low probability of flooding and is considered to pass the Sequential Test.

The Exception Test requires consideration of the wider sustainability benefits of a development and that the development would be safe and residual risks managed.

The Local Plan has a target of a net increase of at least 11,681 dwellings in South Holland over the 25-year local plan period. The Plan considers this new housing is

required to ensure the sustainability of the Local Plan area. The proposed development will contribute to this target.

Section 5 of this Flood Risk Assessment describes the flood mitigation measures and the management of the residual risks, demonstrating that this development will be safe and not increase flood risk elsewhere. The development is considered to pass the Exception Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The River Welland is 120m to the west of the site. The site is 800m west of the Coronation Channel, a bypass channel of the River Welland. The embankments of the Coronation Channel were constructed in the 1950's to convey river flows around Spalding. The Coronation Channel together with the Crowland and Cowbit Washes upstream of Spalding reduce the risk of flooding to Spalding and the surrounding district. The River Welland and Coronation Channel are the responsibility of the Environment Agency.

There is a long-term strategy for the maintenance of the Environment Agency defences which is reviewed and updated periodically.

There is an extensive local drainage network managed by South Holland IDB. There is an IDB High Priority Watercourse 300m to the east of the site. The site and surrounding land are within the Clay Lake catchment and drain by gravity to Clay Lake Pumping Station. The pumping station discharges to the Coronation Channel.

During the operation and maintenance of its pumping stations, associated structures, and channel systems, the IDB seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Boards assets are commensurate with the standard of protection that is sought.

Current maintenance standards of the South Holland Internal Drainage Board and the Environment Agency are generally good.

4.2 Sources of Flooding

The potential sources of flooding that have been identified during this assessment are:

- local blockages to the South Holland IDB drainage system;
- an event in the local drainage network greater that exceeds the standard of protection;
- failure of Clay Lake Pumping Station;
- overtopping or breaching of the Coronation Channel defences; and
- overtopping or breaching of the River Welland.

The Environment Agency Long Term flood maps show that the site is at risk of surface water flooding with depths below 0.3m. The risk of flooding from Anglian Water assets including the foul sewerage system and water supply infrastructure is considered to be a residual risk. Based upon the underlying geology groundwater flooding is not considered likely at the site.

4.3 Probability of Flooding

The probability of flooding associated with blockages in the South Holland IDB drainage system is low due to the maintenance standards achieved and managed by the IDB.

Through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable to providing flood protection to agricultural land and developed areas of 1 in 20 years and 1 in 100 years, respectively. The risk associated with flood events that exceed the standard of protection provided is lowered due to the South Holland IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The Coronation Channel earth embankment has a minimum crest level of +6.0m OD. The 1% annual probability (1 in 100 chance each year) peak flood level inclusive of climate change during the next 100 years in the River Welland is +5.45m OD. The Coronation Channel embankment provides a standard of protection of 1% annual probability (1 in 100 chance each year) with a minimum 0.55m freeboard.

The Cowbit Road on the eastern side of the River Welland provides protection during the 1% annual probability (1 in 100 chance each year) event.

4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded.

4.5 Climate Change

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network and increased flood levels in the River Welland and Coronation Channel.

The River Welland and Coronation Channel defences have been designed to include an allowance for climate change.

In summary the existing systems and defences are appropriate for the design life of the development (i.e., 100 years).

4.6 Residual Risk

There is a residual risk of flooding in the area near the site should a breach occur. The South East Lincolnshire SFRA includes maps demonstrating the impact of a breach in 2116. When the climate change allowances are applied to the combination of a 1% annual probability (1 in 100 chance each year) fluvial event and a 0.5% annual probability (1 in 200 chance each year) tidal event the peak flood

depth during a breach is greater than 2m. An extract from this map is shown in Figure 3 below.

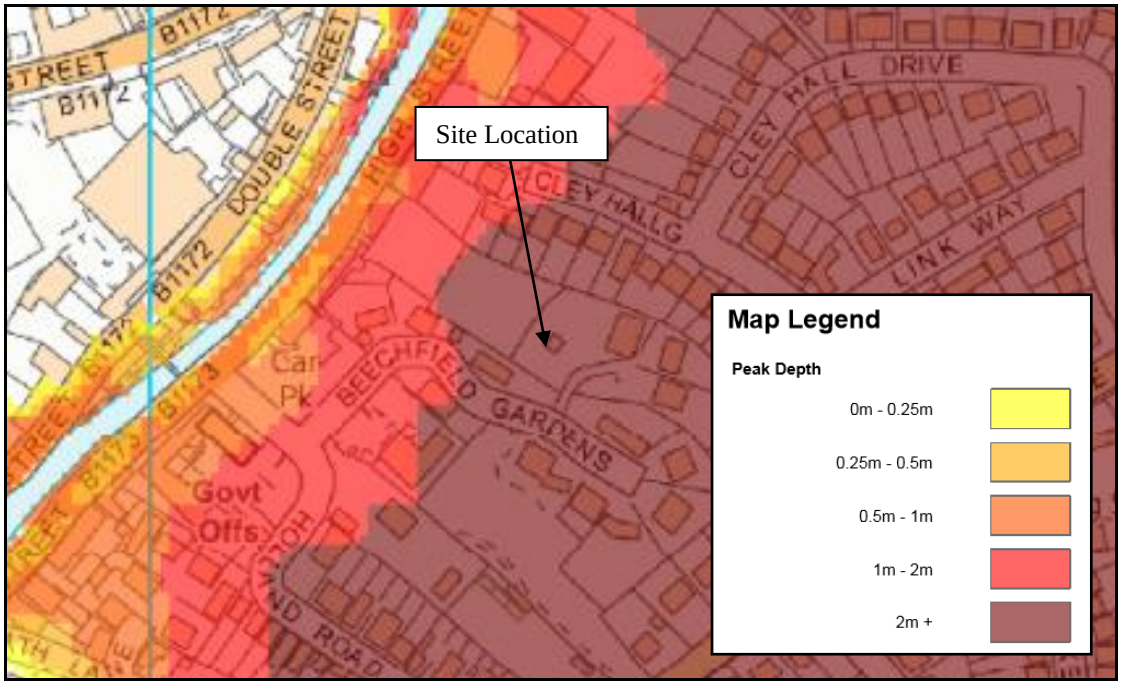


Figure 3 – SFRA 2116 Residual Peak Depth Map

Based upon LiDAR data and the depths and extent of flooding in Figure 3 the flood depth at the site is estimated to be 2.2m.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Clay Lake Pumping Station could lead to an increased level of risk at the site.

The probability of the site flooding from any Environment Agency system is less than 1% annual probability (1 in 100 chance each year) because of the standards of the existing flood defences. Over time there will be a gradual increase in risk to the site due to climate change. During the design life of the development, it is not anticipated that the site would flood from overtopping of the defences.

The SFRA considers the residual risk associated with a breach in the defences in 2116. The site is at risk with a peak depth greater than 2m.

The proposed arrangement increases the impermeable area and therefore there will be an increased volume of surface water that has the potential to increase flood risk.

These risks will be addressed through the mitigation measures set out below.

5.2 Mitigation Measures

The site has a low 'actual risk' of flooding. The proposed mitigation measures are in accordance with the South East Lincolnshire SFRA Standing Advice (Cell C8). Based upon the information available during the preparation of this flood risk assessment, it is proposed that:

- the dwelling will have two storeys with no ground floor habitable accommodation;
- habitable floor levels should be a minimum of 2.2m above ground level; and
- flood resilient measures are considered up to first floor level.

The developer should ensure that the eventual occupier of the dwelling is sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency operates a flood warning system for properties at risk of flooding to enable householders to protect life or take actions to manage the effect of flooding on property. Floodline Warnings Service is a national system run by the Environment Agency for broadcasting flooding warnings. The occupier of the dwelling should register to receive flood warnings.

Should there be a failure of Clay Lake Pumping Station and conditions were such to put properties and land at risk of flooding, the Internal Drainage Board would take emergency action to maintain the drainage level of service by using temporary pumping equipment.

Surface water run-off will be managed so that stormwater from the development will not affect any adjoining properties or increase the flood risk elsewhere.

6.0 CONCLUSIONS

As a result of the assessment, the following conclusions have been reached.

- The proposed development consists of one 2 storey residential dwelling at 1 The Beeches, Spalding.

- The site is located within an Internal Drainage Board catchment and through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable to providing flood protection to agricultural land and developed areas of 1 in 20 and 1 in 100 years, respectively.

- The proposed development is in Flood Zone 3. The site benefits from defences on the River Welland and Coronation Channel that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event including climate change.

- During a breach of the defences the site is at risk with a peak flood depth greater than 2m.

- It is proposed that there is no ground floor habitable accommodation, habitable floor level is a minimum of 2.2m above ground, and there is flood resilient construction to first floor level.

- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

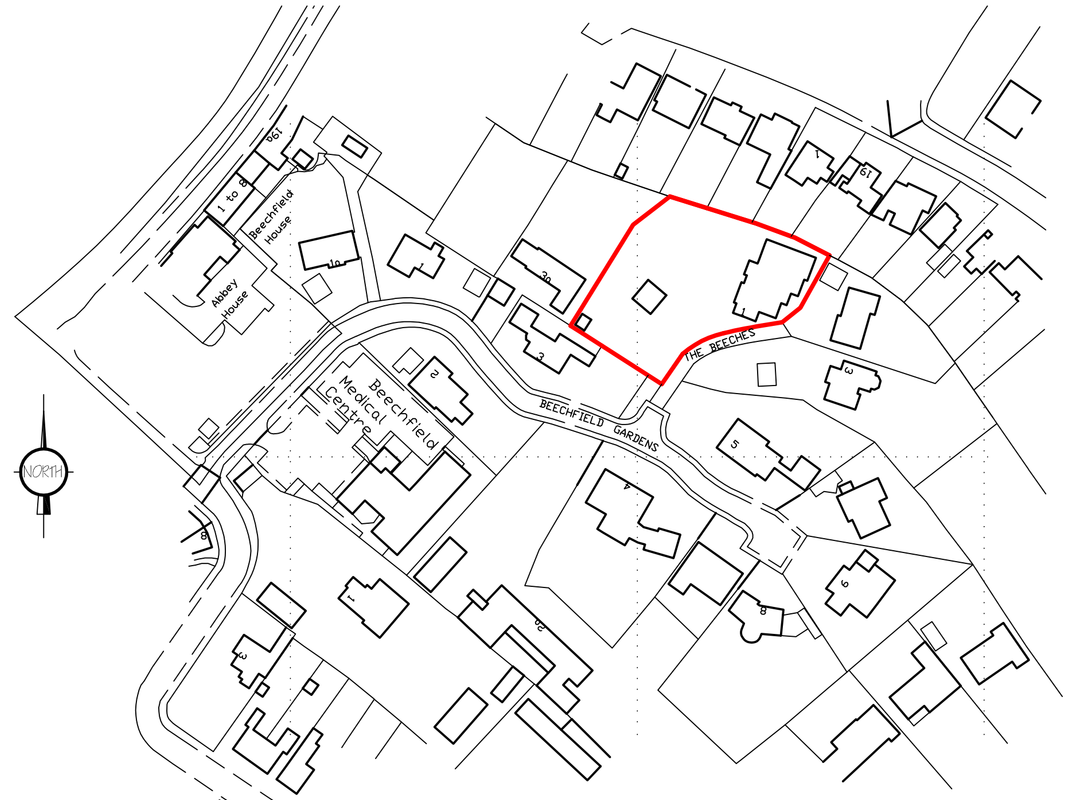
ATTACHMENT 1

SITE & LOCATION PLAN
(Dwg 4046-22 01C)

FLOOR PLANS & ELEVATIONS
(Dwg 4046-22 02A)



SITE PLAN - EXISTING
1/250



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LOCATION PLAN
1/1250



SITE PLAN - PROPOSED
1/250

ref:	revision	date
C	CLIENTS AMENDMENTS	JAN '2023.
B	CLIENTS AMENDMENTS	DEC '2022.
A	SITE MEETING DETAILS	NOV '2022.

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ERECTION OF DWELLING
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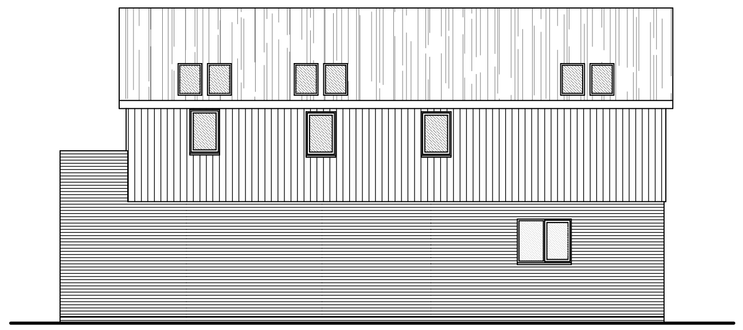
Drawing
SITE & LOCATION PLANS

Job Ref.	Drawing No.
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Date	**Drawn**
JUNE 2022.	S.D.

Scales
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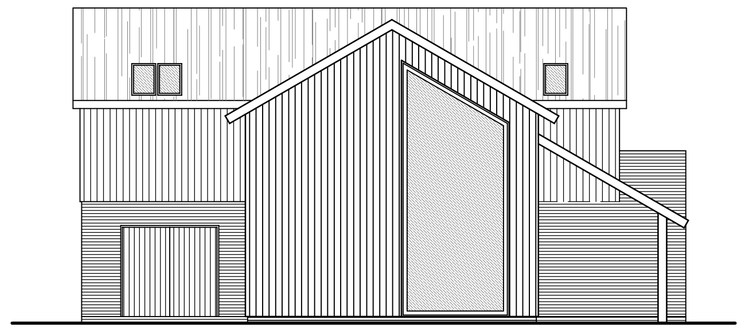
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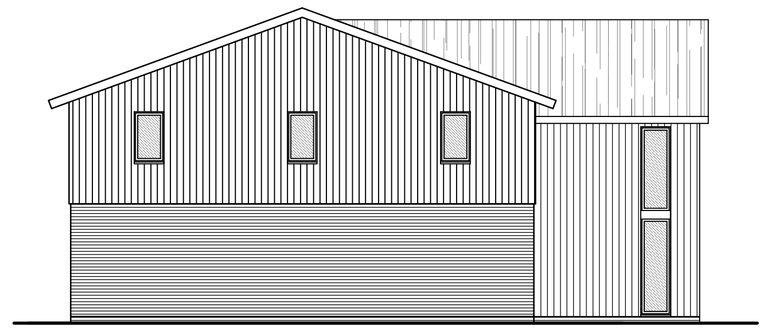
SIDE ELEVATION



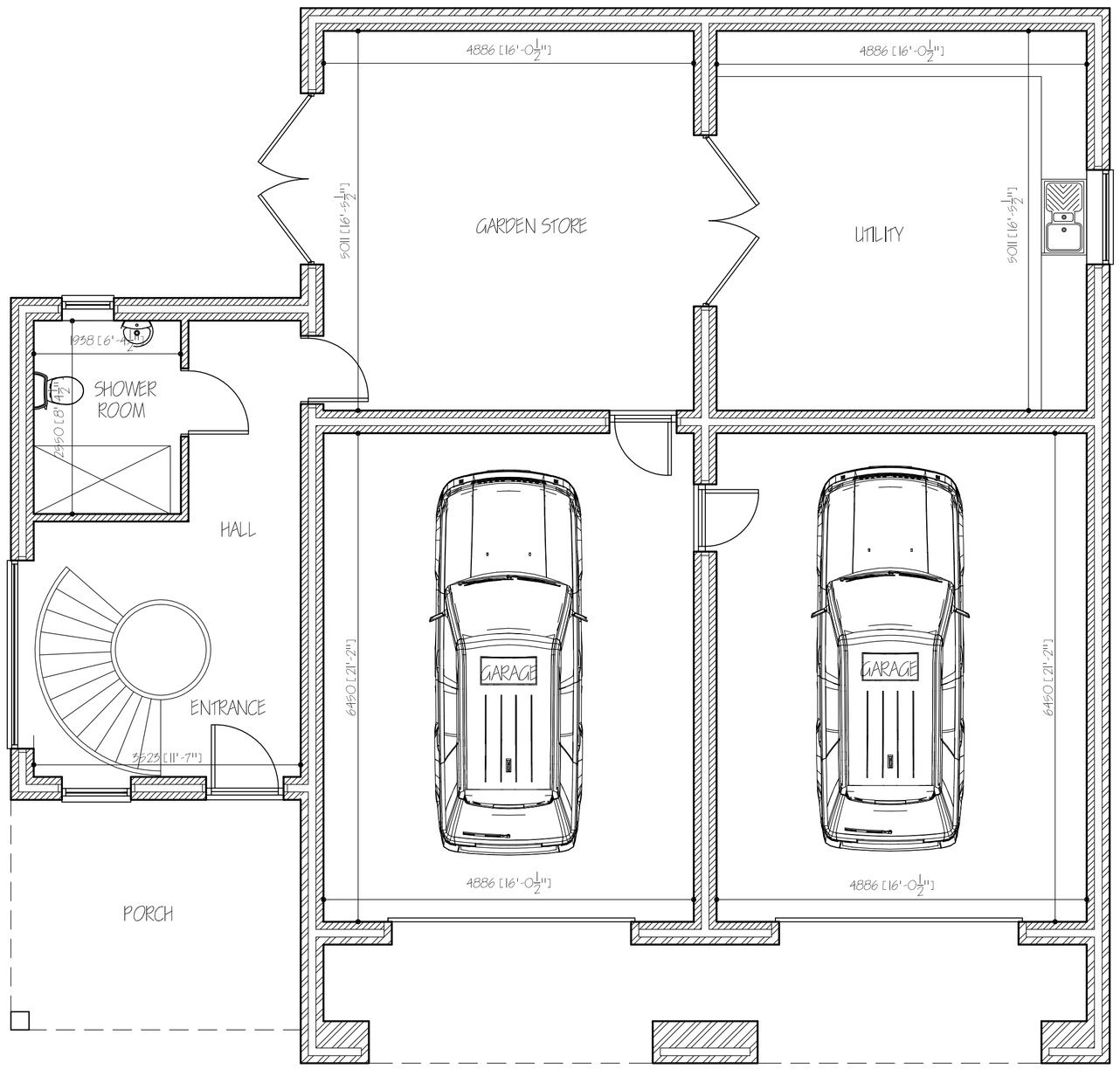
FRONT ELEVATION



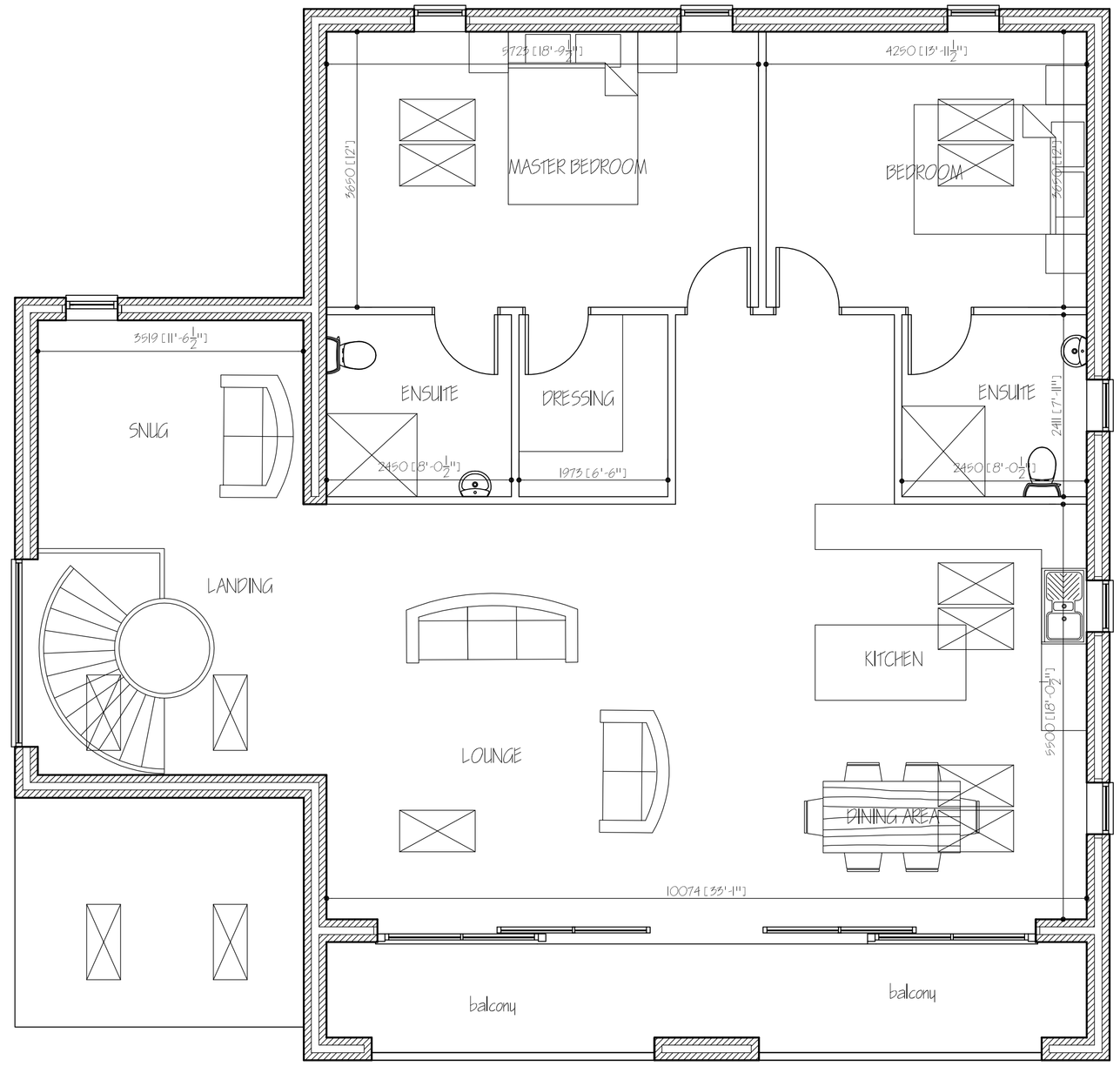
SIDE ELEVATION



REAR ELEVATION



GROUND FLOOR PLAN



FIRST FLOOR PLAN

ref:	revision	date
A	CLIENTS AMENDMENTS	JAN '2025

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